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Unraveling "GenZers"' trust and behavioural intention towards adopting car-sharing services on an emerging market

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ABSTRACT

The present study aims to analyze the influence of specific predictors (performance expectations, transaction costs, technology adoption) on Generation Z's behavioural intention towards car-sharing, offering a unique perspective by incorporating trust as a mediating factor, while addressing gaps in the current literature. To conduct this analysis, the study uses a quantitative approach, where 527 questionnaires were administered in Romania, an emerging market for car sharing. Subsequently, the analysis was conducted using partial least squares structural equation modelling (PLS-SEM) with emphasis on both the direct and indirect impacts that these factors may have on young individuals' willingness to opt for car-sharing solutions. Findings reveal that the model successfully explains 36.2% of the variance in behavioural intentions towards car-sharing. Key findings of the research confirm the significant positive effects of expectations of car-sharing performance and technology embracement on behavioural intentions to use car sharing but indicate a negative impact of transaction costs on the respective intention. At the same time, unexpectedly transaction costs displayed a positive influence over passengers' trust, while the other drivers had positive influences on passengers' trust, as assumed. The results also highlight the significant mediating role of passenger trust across all hypothesised relationships within the model, pointing to the complex nature of factors influencing car-sharing adoption among Generation Z. The contributions of the research are multi-folded. First, from a theoretical perspective, the study reinforces the use of the Theory of Planned Behaviour (TPB) in the particular context of car-sharing for a specific user category, GenZ, while expanding the TPB model by adding trust as a psychological mediator. Further on, in applicative terms, implications are both practical (i.e., suggesting enhanced management and communication strategies for car sharing providers) and policy oriented (i.e., suggesting policy directions for policy makers in terms of sustainability and awareness development).

1. Introduction

A sharing economy can be defined as an economic system in which businesses provide temporary access to goods in the form of services without transferring ownership and employing online platforms to reduce transaction costs (Ranjabari, Morales-Alonzo, & Carrasco-Gallego, 2018). Avoiding idle possessions of goods has a strong impact on the environmental, social and economic (ESG) pillars of sustainability. From an environmental perspective, this reduces the production of goods that are not fully used and become obsolete before being fully exploited. From a social perspective, the sharing economy (and car-sharing) can also allow access to goods for low-income people. From an economic-governance standpoint, the sharing economy can enable a manufacturing system to be more effective and "lean" in the allocation of resource-free capacity (Khan & Liu, 2023).

The sharing economy concept is used in relation to various activities, including accommodation, labor and diverse forms of transportation (i.e. bikes, scooters and cars). Applying the concept of shared economy to

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transportation leads to the concept of shared mobility. The present undertaking seeks to explore urban mobility with car-sharing and to examine the behavioural intentions of users. Among mobility-sharing systems, one popular form of shared mobility is the car-sharing system. Car-sharing consists of the possibility of renting a car for short periods of time (even minutes) or a ride via dedicated internet platforms and mobile applications (Turoń, 2023a; Vătămănescu, Dominici, Ciuciuc, Vițelar, & Anghel, 2024). Business to Consumer (B2C) car-sharing system is the most frequently encountered form and has developed different types. Appendix A offers details on the main B2C car sharing systems.

Given the high level of development that car-sharing encountered in the recent years (Turoń, 2023b) and also benefits associated with the system (convenience, improved transfer speed, reduced transfer costs) (Savastano, Suciu, Gorelova, & Stativă, 2023) and the problems that it solves (less pollution, less traffic, less parking need, less noise) (Schulz, Böhm, Gewald, & Krcmar, 2021), it is of interest to study the factors that can affect either positively or negatively the demand for car-sharing services in order to better understand the phenomenon.

Behavioural approaches and determinants have been the cornerstone for understanding car-sharing adoption. Key factors, such as perceived ease of use, performance expectations, transaction costs and trust, are emphasized in the literature (Haldar & Goel, 2019; Kaplan, Manca, Nielsen, & Prato, 2015; Ma et al., 2020; Vătămănescu, Dincă, Cegarra-Navarro, Gazzola, & Amelio, 2025). These determinants provide a lens through which to evaluate user behaviours and their inclination to adopt car sharing.

But the car-sharing research field is far from saturated, with more empirical studies analysing the mechanisms that lead to consumers embracing car-sharing (Hjorteset & Böcker, 2020), being in demand. Schulz et al. (2021) emphasized that there is limited knowledge about the desires, priorities and needs of potential consumers of car-sharing. Turoń (2023a) considers that research is short in relationship with factors related to the financial and cost issues of car-sharing services, with further research being needed in this direction. Vătămănescu, Nicolescu, Gazzola, and Amelio (2023) acknowledge that research on additional factors that influence the adoption of car-sharing, such as trust or performance expectations, can shed more light on drivers using car-sharing. Concomitantly, Long and Axsen (2022) opined that future research could analyze consumers' behaviour related to car-sharing by considering their interest in technologies, thereby revealing the relevance of technology embracement as a driver to explore in the context of behavioural intentions regarding car-sharing. There are also calls for further research on the psychological barriers on transportation intentions (Ramos, Bergstad, Chicco, Chicco, & Diana, 2020) and for the study of psychological factors, such as trust, considering both their direct and indirect influence on buying intention (Hartl & Hofmann, 2022; Kuhn, Marquardt, & Selinka, 2021).

Giving credit to the claims for further investigation of the topic and trying to fill in some of the previously mentioned research gaps, the present research provides more empirical evidence about what influences the intention to resort to car-sharing services and what are the drivers of CS buying intention. This study emphasises behavioural approaches, exploring determinants such as performance expectations, transaction cost and technology embracement to understand car-sharing adoption, supplying the unique contribution of integrating these behavioural determinants with a generational lens focusing on Generation Z and underscoring the mediating role of trust in adoption decisions. The present research also, incorporates trust in a unique way, as both a direct antecedent of CS buying intention, but also as a mediator of the relationship between other more classical antecedents (such as performance and quality of service, technology orientation and transaction costs) and CS buying intention.

In the present study, we address some of the abovementioned research gaps and we investigate how consumers respond to a modern type of mobility (i.e. car-sharing), with a focus on B2C car-sharing, as the most common type of car-sharing (Nansubuga & Kowalkowski, 2021). The research questions that we attempt to answer are:

RQ1: What are the antecedents for behavioural intention regarding CS usage? The two main objectives associated with this research question are: O1.1: to identify the antecedents for the behavioural intention regarding CS usage and O1.2. to determine how the relationships between these antecedents and the behavioural intention regarding CS usage are mediated by trust as a psychological factor.

RQ2: What is the relationship between trust and behavioural intention in B2C car sharing? The two main associated objectives are O2.1: to identify possible antecedents of passengers' trust in car-sharing providers and O2.2: to determine the direct and indirect influences of trust on behavioural intention regarding car-sharing usage.

To answer these research questions and to achieve these objectives, we focused on three main influencing factors based on their importance, as perceived and presented in the literature: a) the expected performance of car-sharing as an important driver with a positive influence on buying intention (Ramos et al., 2020); b) the transaction costs of car-sharing as an important antecedent with an unfavourable influence on buying intention, as cost elements related to car-sharing have an unfavourable influence on its adoption (Perboli, Ferrero, Musso, & Vesco, 2018); and c) technology embracement as one of the most important attitudinal factors that are highly related to the specificity of the service (IT-enabled) (Long & Axsen, 2022).

The dependent variable is the behavioural intention to use car-sharing and we advance passengers' trust as a mediating variable, given that trust is generally seen as one of the main drivers of buying intention (McKnight, Choudhury, & Kacmar, 2002) which also applies in the case of car-sharing (Gao, Jing, & Guo, 2017).

The paper is organized as follows: the next section develops the theoretical background, the conceptual model and the associated hypotheses; the methodology employed is presented in the Methods and Materials section with details on data collection and data analysis; the Results section illustrates the statistical findings of the research and encompasses discussions of the findings and how they relate to the literature; and the last section concludes the paper, bringing forward the theoretical, practical and policy implications of the study.

2. Theoretical background, conceptual model and hypotheses development

2.1. Theoretical background – Theory of planned behaviour (TPB)

The main theory that represents the starting point for the present study is the theory of planned behaviour (TPB), a classical theory for predicting individual behaviour. Ramos et al. (2020, p. 2) explain that "the theory of planned behavior (TPB) states that behavior can be predicted by intentions that are themselves in turn predicted by attitudes, social norms and perceived behavioral control". In this research, the behaviour under lens refers to buying CS services with its immediate antecedent, the behavioural intention regarding CS, that further is influenced by various factors. The present study has the purpose of evaluating antecedents for the CS buying intention, in line with TPB model. According to the TPB (Ajzen, 2020), the three main determinants of individual intention include attitude towards behaviour, subjective norms and perceived behavioural control, that in their turn are influenced by corresponding beliefs. Generally, attitudes towards behaviour refer to the way an individual evaluates positively or negatively the behaviour in discussion (Chen & Slade, 2025) (here, the behavioural intention regarding CS). In the present study, attitude is explained by the expectation of performance of CS, that can be both positive and negative. When passengers consider that using CS services brings comfort, ensures saving of time and convenience, the intention to buy CS service goes up and vice versa. Having a favourable attitude about CS performance is thus expected to lead to favourable buying intention towards CS.

Subjective norms – also encountered as perceived norms - generally refer to the level of perceived social pressure to perform a certain behaviour (Ajzen, 2020). In this study, perceived norms are seen as the way in which individuals sense that they have to embrace new technologies that others use (e.g., smart phones), technologies that would further facilitate the use of CS services. Therefore, technology embracement is seen as a determinant that positively impacts the behavioural intention towards CS. Additionally, the perceived behavioural control generally refers to the factors that might hinder or encourage the performance of the behaviour (Ajzen, 2020; Chen & Slade, 2025). In the present case, the intention to buy CS services might be affected by the transaction costs (money, time, effort). When the time and the effort to collect information and to understand CS processes in order to access them are high, transaction costs become an impediment that unfavourably impacts the behavioural intention regarding CS.

The application of the theory of planned behaviour (TPB) in this study as a guiding conceptual framework, is particularly appropriate for a number of reasons. First, using the model allows for comprehensively capturing the influence of attitudes (expectations on performance), perceived control (transaction costs) and subjective norms (technology embracement), which are significant drivers to better understand the behavioural intention towards car-sharing. Also, as we will present further, the research uniquely integrates the above influencing factors in the context of Generation Z, while at the same time integrating trust (and its psychological impact) as both a direct influencer and as a central mediating variable for the intention of buying CS services. Second, even though other recently popular conceptual models to evaluate buying intention are available, such as the Technology Acceptance Model (TAM), for the purpose and scope of the present research, we consider that the TPB is a better choice based on the following arguments: a) TAM is a content specific model that measures intention only in regards to technology acceptance, while TPB is formulated at a broader level (Ajzen, 2020) and can be used in various fields for measuring intention. In the present research, the behaviour in discussion is buying car-sharing services and even though this type of service presupposes the use of certain information technologies (e-platforms), the service itself is about transportation combined with technology in the form of e-mobility; b) TAM considers two fixed antecedents to technology acceptance, namely perceived usefulness of the technology and ease of use of the technology, limiting therefore the span of possible drivers. At the same time, TPB permits the inclusion of a larger number of drivers that fit into the three main categories of antecedents of the model, drivers that can be chosen in an adapted way for the specific purpose of the study and of the field that is researched. Consequently, it is considered that TPB allows for both larger number of influencing factors and more useful and complex information and interpretations (Ajzen, 2020), including the case of CS services and c) even though one of the TPB limitations is considered to be the disregarding of the emotional influence on buying intention (Chen & Slade, 2025), in order to overcome this limitation, the present research includes trust as a psychological element and considers both its direct and its mediating influences on behavioural intention regarding CS. Third, the TPB model has been previously successfully applied to other transportation studies (Kaplan et al., 2015) and car-sharing studies (Haldar & Goel, 2019; Kuhn et al., 2021; Vătămănescu et al., 2025, 2023), being already tested and proven as a relevant model in this field of study.

Therefore, the TPB model was considered appropriate for the present study to approach car-sharing systems. The following sections focus on the relationship between passengers' trust and behavioural intention regarding car-sharing usage by considering the above set of influencing factors for these two variables.

2.2. Antecedents of passengers' trust in car-sharing services providers

Generally speaking, trust in the context of market relationships, has been seen as a multifaceted construct that depicts the attitude, the confidence and the expectation that a subject (e.g. a company) with certain characteristics (honesty, competence, etc.) will have a certain behaviour that will result in a positive outcome (e.g. performance) for the one who trusts the subject (Castaldo, Premazzi, & Zerbini, 2010, pp. 665–666). From a customer's perspective, trust has been seen as a consumer's confidence in the integrity, honesty, reliability and comfort offered by a company (Moorman, Deshpandé, & Zaltman, 1993), which represents the basis for building a relationship between the consumer and company (Jones, Wilkens, Morris, & Massera, 2000). In the case of car-sharing, passengers' trust is referred to as their confidence in the reliability and integrity of car-sharing platforms (Ma et al., 2020). Trust is seen as one of the most important mechanisms that encourage participation in car sharing and at the same time, is an important concept in research conducted on the sharing economy in general (Hartl & Hofmann, 2022).

Customer trust, in general, can be influenced by different categories of factors and trust in car-sharing services is influenced by aspects such as the reputation of the car-sharing platform and the familiarity of the consumers with the car-sharing platform (Gao et al., 2017), environmental concern (Kuhn et al., 2021), privacy of information (Zavvos et al., 2022), feedback mechanisms, surge pricing and payment security (Shao & Yin, 2018). In this study, we consider other factors as influencers of passengers' trust: one classical factor with a potentially favourable influence (performance), one classical factor with a potentially unfavourable influence (transaction costs) and one specific factor highly related to the way car-sharing operates (technical orientation).

In addition, uncertainty about a service's performance constitutes a barrier to car-sharing demand (Nansubuga & Kowalkowski, 2021), illustrating the positive role of the performance of services in building trust, interest and demand in car-sharing. Furthermore, the perceived value of a service, which is also dependent on the service's performance, forms a basis for passengers' trust (Ma et al., 2020) in the case of car-sharing services. Aspects such as accessibility of the car to the right place and comfort when travelling (Ramos et al., 2020) are also elements of the expected performance of car-sharing and can influence consumers' trust in a particular car-sharing platform. Consequently, expectations of car-sharing performance and the actual performance of car-sharing contribute to building trust in car-sharing platforms. Expectations of performance are also related to the reputation of the car-sharing platform, which was found to be a main influencer for the trust individuals have in car-sharing (Gao et al., 2017). Based on these considerations, we state the following:

H1: Expectations of performance of car-sharing (EP) directly and positively influence passengers' trust in car-sharing services providers (PTR).

Trust in car-sharing can also be influenced by the level of transaction costs associated with the use of car-sharing services. In general, transaction costs refer to the expenses people pay for exchanges that occur between them. Transaction costs include information search costs, bargaining costs and execution costs (Tate, Dooley, & Ellram, 2011) and when referring to the shared economy and online purchase systems, they consist of searching, monitoring and adaptation costs (Li & Fang, 2022). According to Ma et al. (2020), in the specific case of car-sharing services, transaction costs include a) information search costs, as passengers usually collect information about the service (type of service, price of parking slots) before using it; b) a comparison between different car-sharing platforms takes place before choosing a car-sharing service, which can be associated with the bargaining element of the transaction costs; and c) the costs of picking up the car from the parking slot are associated with the execution element of the transaction costs. The reduction in such transaction costs, together with a larger availability of car-sharing services, can favourably influence passengers' trust (Thitimajshima, Esichaikul, & Krairit, 2018). When costs, such as information acquisition about car-sharing services, are high and the customer needs to put a large effort and invest time to obtain it, their confidence in the reliability of the car-sharing platforms is likely to

diminish (Nansubuga & Kowalkowski, 2021). Therefore, the following hypothesis is formulated:

H2: The transaction costs of using car sharing (TC) negatively influence passengers' trust in car sharing services providers (PTR).

Passengers' trust is the degree to which customers trust car-sharing operators (Curtale, Liao, & van der Waerden, 2021; Hartwich, Witzlack, Beggiato, & Krems, 2019). Car-sharing platforms function based on the incorporation of new information technologies (Acheampong & Siiba, 2020) that mediate relationships with customers (Albino, Berardi, & Dangelico, 2015). People with greater openness to new technology express a higher interest (also based on trust) in using shared vehicles (Potoglou, Whittle, Tsouros, & Whitmarsh, 2020). Consequently, individuals who are technology-oriented and usually adopt new technologies are more inclined to trust car-sharing systems (Turoń, 2023a) as services that are highly related to new IT apps. This leads to the following hypothesis:

H3: Technology embracement (TE) directly and positively influences passengers' trust in car sharing services providers (PTR).

2.3. Antecedents of behavioural intention regarding car-sharing usage

Specialized literature has identified that behavioural intentions regarding car-sharing usage have numerous and diverse antecedents, such as the perceived benefits of car-sharing, technology innovation attitudes, perceived innovativeness of car-sharing, trust, environmental attitudes (Acheampong & Siiba, 2020), performance expectancy, effort expectancy, social influence, safety concern, hedonic motivation, personal attitude, trust, technology orientation (Curtale et al., 2021; Curtale, Liao, & Rebalski, 2022), attitude towards car-sharing, environmental concern, initial trust, subjective norms (Kuhn et al., 2021), environmental consciousness, financial awareness and sociability (Hjorteset & Böcker, 2020).

Among these, we also focus on the three essential factors presented above as those with a high level of importance that cumulate diverse directions of influence, namely ease of technology use, performance expectancy, convenience, or flexibility. Dominici, Roblek, Abbate, and Tani (2016) highlighted how car drivers require ease of use of the technology to achieve customer satisfaction. Performance expectancy is a classical predictor of the unified theory of acceptance and use of technology (UTAUT) framework that also applies to the transport field (Ribeiro, Gursoy, & Chi, 2022) and has been found to be a significant driver of the behavioural intention to use car-sharing services (Curtale et al., 2021; Curtale et al., 2022; Tran, Zhao, Diop, & Song, 2019). More specifically, elements such as convenience and flexibility (Correia, Jorge, & Antunes, 2014), comfort and speed (Becker, Ciari, & Axhausen, 2017) and usefulness and ease of use (Long & Axsen, 2022) influence the intention to adopt car-sharing services. They all relate to customers' expectations of the performance of car-sharing systems. Consumers' expectations of high levels of convenience, flexibility, comfort and speed, in one word of higher performance, are associated with stronger desires and intentions to use car-sharing services. Therefore, we assume that:

H4: Expectations of the performance of car-sharing (EP) directly and positively influence behavioural intention regarding car-sharing usage (BICS).

Transaction costs negatively impact adoption rates due to financial awareness and effort expectations (Curtale et al., 2021; Hjorteset & Böcker, 2020). A high level of transaction costs (information search, bargaining, monitoring and execution) for using car-sharing services naturally determines passengers to continue to use other transportation means, such as private cars, taxis, or public transport (Ma et al., 2020). When the cost of searching for accurate information and comparing different car-sharing platforms is high and when customers need put a lot of effort and time in searching and comparing information and in changing the service to be relevant to their requirements, customers' intention to buy the service is unfavourably affected and diminishes (Li & Fang, 2022). This is reinforced by the fact that costs' awareness was found to have a strong and negative effect on the intention to use car-sharing services (Hjorteset & Böcker, 2020). Simultaneously, lowering transaction costs can attract passengers who usually use other transportation modes, such as taxis (Ma et al., 2020). Accordingly, we hypothesise the following:

H5: The transaction costs of using car-sharing (TC) negatively influence behavioural intention regarding car-sharing usage (BICS).

As car-sharing systems are IT-mediated transportation systems (Shaheen & Cohen, 2013), they are supposed to attract more tech-savvy individuals (Prierto, Baltas, & Stan, 2017) and have a high interest in using digital platforms and mobile applications (Schulz et al., 2021). In her literature review, Turoń (2023a) found three studies that proved that individuals who are passionate about new technologies and have advanced technological knowledge also have a higher propensity to use car-sharing systems. Similarly, Savastano et al. (2023) identified the preference of technologically oriented people for using smartphones together with specific mobile apps to obtain real-life information about transport solutions, as in the case of car-sharing. Consequently, we assume that:

H6: Technology embracement (TE) directly and positively influences behavioural intention regarding car-sharing usage (BICS).

2.4. The direct and the mediating role of trust for behavioural intention on car-sharing

Trust is seen as very important in driving economic agents towards compliant behaviours (Castaldo et al., 2010). Passengers' trust represents a driver of the buying intention of CS. Trust in others is necessary when using car-sharing, which is justified by the results of different studies that have found trust issues to be a major concern for car-sharing (Kent & Dowling, 2018) or that trust is a key barrier to using car-sharing services (Ballús-Armet, Shaheen, Clonts, & Weinzimmer, 2014).

The level of trust that people have in strangers to share their ride was found to motivate the use of car-sharing (Hartl, Sabitzer, Hofmann, & Penz, 2018) and therefore, it is a factor that is associated with passenger trust in car-sharing services. Participation in car-sharing, as for collaborative consumption, implies a level of trust in other people who are not known, but also trust in car-sharing services and in car sharing service providers (Hjorteset & Böcker, 2020). Trust plays a central role in the process of adoption intention and consumer behaviour related to new technologies (Kuhn et al., 2021). Trust was considered a driver of car-sharing services behavioural intention in other studies (Curtale et al., 2021) and it is considered in the present study as well. Therefore, we assume that:

H7: Passengers' trust in the car-sharing services providers (PT) directly and positively influences behavioural intention regarding sharing usage (BICS).

Trust in car-sharing services is seen as having a direct and predictive influence on the intention to adopt car-sharing (Acheampong & Siiba, 2020; Curtale et al., 2021). However, simultaneously, the trust that passengers have in car-sharing services providers is determined by other influencing factors. By considering both the antecedents of passengers' trust in car-sharing services and the direct impact of trust on buying intention, we assume a mediating role of trust in the relationship between the influencing factors and buying intention of car-sharing services.

Expectations of car-sharing performance contribute to increasing trust in the car-sharing services providers, while trust is a good predictor of increased behavioural intention to use car-sharing services (Curtale

et al., 2021). Consequently, we hypothesise the following:

H8: Passengers' trust in the car-sharing services providers (PTR) positively mediates the relationship between expectations of performance of car-sharing (EP) and behavioural intention regarding car-sharing usage (BICS).

Cost savings represent a strong reason for joining car-sharing services (Vejchodská, Brůhová Foltýnová, & Rybičková, 2023) and whenever costs related to car-sharing are high, they become demotivators for using the service, as trust in the service is also affected. Other financial aspects, such as surge price setting, affect customers' trust and continued intention to continue to use car sharing services (Shao & Yin, 2018). Transaction costs, as a specific element of costs that incur for customers when using car sharing services, encompass the non-monetary efforts, as well as the additional costs associated with exchanging the vehicle service. The relationships between transaction costs and passengers' trust on the one hand and behavioural intention to use car-sharing services on the other hand, are seen to be negative, as higher transaction costs diminish the trust and the intention to adopt car-sharing services (Nansubuga & Kowalkowski, 2021). However, a higher level of trust in the car-sharing platform (owing to other attributes) compensates for the negative effect of transaction costs. Trust can assist consumers in overcoming perceived risks (such as costs) and uncertainty when using car-sharing services (Kuhn et al., 2021).

Therefore, we assume that:

H9: Passengers' trust in car sharing services providers (PTR) positively mediates the relationship between transaction costs of using car sharing (TC) and behavioural intention regarding car sharing usage (BICS).

People who focus on technology more than others and use smart devices on a regular basis are inclined to use IT apps for mobility purposes and to operate with smart mobility solutions (Schulz et al., 2021) because they trust such mobility solutions. Car-sharing represents a form of smart mobility solution (Savastano et al., 2023) and is trusted by technically oriented individuals (Wawer, Grzesiuk, & Jegorow, 2022). Further, a higher level of trust in IT-enabled car-sharing results in stronger interest (Potoglou et al., 2020) and intention to adopt car-sharing services offered by car-sharing operators (Curtale, Liao, & van der Waerden, 2021a). Therefore, we assume:

H10: Passengers' trust in car-sharing services providers (PTR) positively mediates the relationship between technology embracement (TE) and behavioural intention regarding car-sharing usage (BICS).

Fig. 1 presents the research model that we developed, which includes the considered variables for which, according to the above-formulated hypotheses, we aim to test direct and indirect relationships.

3. Materials and methods

3.1. Data collection

The present study aims to investigate the interrelationships between various key factors, including Expectations of performance of CS (EP), Transaction costs of using CS (TC), Technology embracement (TE), Passengers' trust in CS services providers (PTR) and Behavioural intention regarding CS usage (BICS) (as illustrated in Fig. 1). Convenience sampling was employed to obtain a large number of replies. However, the specific demographic group under consideration was Generation Z, as they are believed to exemplify the sustainability-oriented perspective prevalent in contemporary society. Pursuant to scholars (Prierto et al., 2017; Vejchodská et al., 2023) who have searched the profile of car-sharing users, the main features of typical users of car-sharing services are being young and highly educated, as well as environmental conscious (Vătămănescu et al., 2025). Also recently, Daniele, Ricchetti, and Rotaris (2025) identified the main characteristics of the CS user in Italy: young, male, having higher education, living in urban areas and having a good income, while Dyba and Kisiała (2024) identified similar socio-demographic characteristics of CS users in Poland: young, studying or with a university degree, above average financial situation, digital natives. Generation Z (Gen Z) is commonly defined as the cohort born between 1997 and 2012, though specific date ranges may vary slightly depending on sources. This generation is characterized by their integration with digital technology from an early age, their emphasis on social and environmental responsibility and their diverse perspectives shaped by global connectivity, openess to challenges and adventures, dependence on internet and social media and being very good in multitasking (Dimock, 2019; Seemiller & Grace, 2016; Wawer et al.,

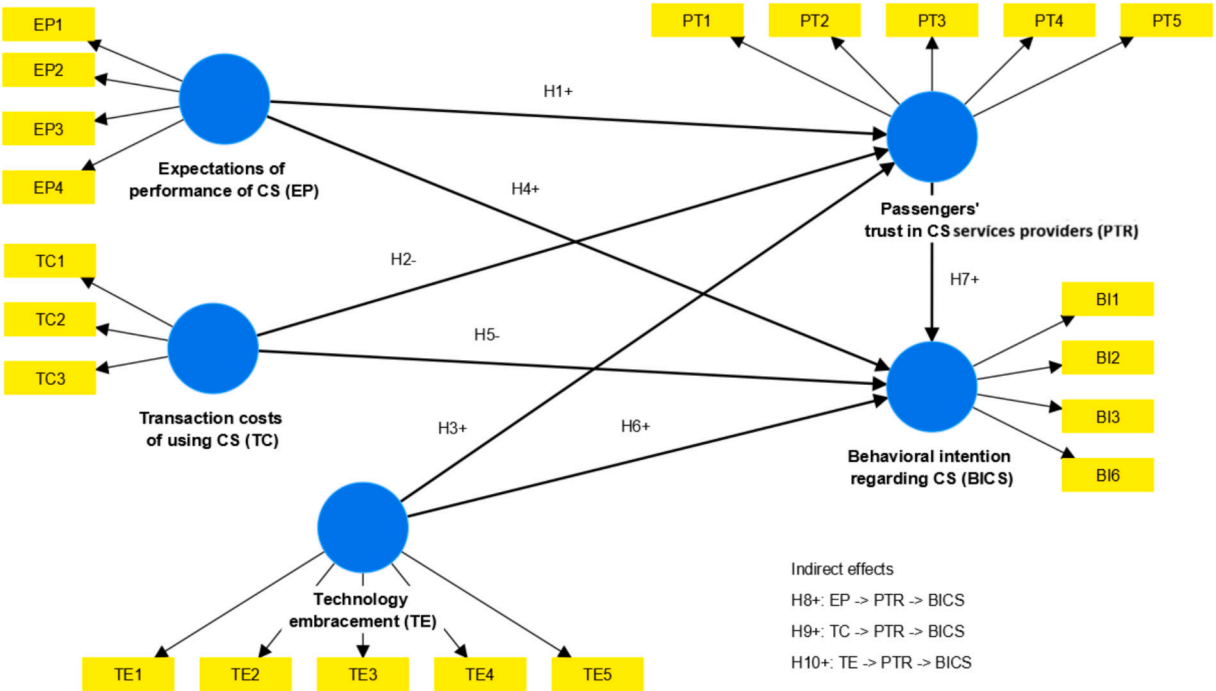

Fig. 1. Conceptual model.

2022). Gen Z is seen as the first true digital native generation (Francis & Hoefel, 2018), with specific features such as independent but collaborative, interactive and social consciousness (Prasanna & Priyanka, 2024). Therefore, Gen Z was considered to be an appropriate and relevant group to be studied, given the large overlapping with the characteristics to the typical profile of CS users group, respectively the group of young, educated and also IT oriented users, in terms of demographics, but also in terms of psychographic features, such as being environmentally friendly.

Data collection was conducted from March to July 2023 using online distributed questionnaires. In order to ensure that the questionnaire items were explicit and adequate, a pilot test was carried out with 10 subjects from an economics university. Following this stage, several items were slightly adjusted to ensure readability and a better understanding. Additionally, construct explanations were added in the research instrument to avoid confusion or partial comprehensiveness (e.g., definitions of different services associated with car sharing). Appendix B present the questionnaire. Furthermore, to avoid potential sampling biases introduced by convenience sampling, the invited respondents were selected from various high schools and universities across the country, from different education levels (i.e., from high school participants to doctoral students), the targeted educational institutions having different profiles (e.g., economics, political science, communication studies, computer science, etc.). As the authors of the study come from different universities and cities, the data collection strategy was to ensure a broad coverage of participant profiles, thus limiting the bias of age, education level or field. Consequently, the research team resorted to facilitators from various educational institutions to disseminate the link to the online questionnaire during their classes. The researchers used informed consent procedures, as respondents were informed about the purpose of the study, confidentiality of their responses and explicitly asked about their willingness to complete the form, both when they were first contacted and invited to participate to the survey and also at the beginning of the questionnaire (See Appendix B).

To estimate the minimum sample size, G*Power Analysis was employed (Cunningham & McCrum-Gardner, 2007). A preliminary test was run using a Linear Multiple Regression framework to determine the necessary sample size. Based on these findings, it was determined that a sample size of 74 questionnaires was necessary to detect an f2 effect size of 0.15. Consequently, a comprehensive total of 527 participants from Romania completed the research questionnaire. The mean age of the participants was 22.1 years old, with almost 80% participants ranging from 19 to 23 years old. Given the non-normal distribution of subjects across age intervals, relevant inter-group comparisons could not be conducted at this point. The detailed socio-demographic characteristics of respondents are presented in Table 1.

Table 1
Socio-demographic characteristics.

Variable	Categories	Percentage
Gender	Male	37.8%
	Female	62.2%
Car sharing prior knowledge	Yes	78%
	No	22%
Car sharing prior usage	Yes	70%
	No	30%
Education level	High school	14.2%
	Bachelor student	52.2%
	Master student	26.8%
	Doctoral student	3.6%
	Other	3.2%
Driving licence	Yes	75.1%
	No	24.9%
Car property	Yes	81%
	No	19%

3.2. Method

The study relied on an empirical quantitative research methodology that involved the distribution of questionnaires by the authors via different channels (emailing, university social media and formal university channels). The authors conducted a partial least squares structural equation modelling (PLS-SEM) analysis on the conceptual model using SmartPLS 4.0 (Ringle, Wende, & Becker, 2022). Based on scholarly literature (Hair, Black, & Babin, 2010), multiple analyses were performed on the indicators and constructs under investigation. Following the evaluation of the measurement model, the structural model underwent additional assessment. Additionally, in order to investigate potential significant differences between various subgroups from the perspective of the behavioural intention regarding CS, several preliminary analyses (i.e., Independent-Samples *t*-Tests) were run using the IBM SPSS 20 version. The results indicated that there are both significant and insignificant differences in terms of subgroups for the following grouping variables: *Car sharing prior knowledge* - $t(527) = 0.699$, $p > 0.05$, *Car sharing prior usage* - $t(527) = 0.916$, $p > 0.05$, *Gender* - $t(527) = -4.510$, $p = 0.000$, *Driving licence* - $t(527) = -0.156$, $p > 0.05$, *Car property* - $t(527) = -1.564$, $p > 0.05$. As shown in the retrieved results, *Gender* is the only grouping variable which reveals significant differences between subgroups, namely male ($m = 3.458$, $sd = 0.455$) vs. female ($m = 3.368$, $sd = 0.438$). With a view to testing possible differences among the subgroups derived from the *Education level* variable, One-Way ANOVA was applied. Given that the Levene test was significant - $F(4,522) = 2.888$, $p < 0.05$, we further run the the Post hoc "Equal variances not assumed" (i.e., Games-Howell). However, the Post hoc tests, multiple comparisons, did not indicate any meaningful differences among the targeted subsets in terms of education level. By corroborating these findings, we concluded that a multigroup analysis (MGA) based on *Gender* should be further conducted on purpose to capture model variations.

3.3. Measures

The variables were conceptualized as reflective in nature, as their indicators represent distinct aspects of the construct. Consequently, all these measures were operationalized in the form of composites classified as type A. The conceptual model encompassed five constructs: Expectations of performance of CS (EP), Transaction costs of using CS (TC), Technology embracement (TE), Passengers' trust in CS services providers (PTR) and Behavioural intention regarding CS usage (BICS). Following reliability and validity tests, one item was excluded from the analysis.

The variables were built on existing models tested in previous studies. Table 2 presents all variables of the research model and their items, including the bibliographical sources used. All items were formulated as statements and measured using a Likert scale ranging from 1 to 5, where 1 represents strongly disagree and 5 represents strongly agree. Table 2 presents an overview of the constructs and indicators used in the model, together with the psychometric qualities that validated the reliability and validity of each scale. This study aimed to provide a clear understanding of the composition of each variable and its associated measurements.

4. Results and discussion

4.1. Evaluation of the measurement model

During the initial stage of the measurement model evaluation, the assessment of data validity and reliability was conducted using statistical techniques, such as Cronbach's alpha, average variance extracted and composite reliability. The loadings of the items (Fig. 2) and variance inflation factors were documented. Table 3 presents the results of the discriminant validity analysis by applying both the Fornell-Larcker and

Table 2
Variables and psychometric properties.

Variables	Indicators	Cronbach's Alpha	Composite reliability (rho_a) (CR)	Average variance extracted (AVE)
Expectations of performance of CS (EP) adapted after Curtale et al. (2021).				
I expect that the car-sharing service…				
EP1.	…is safe and comfortable.			
EP2.	…will help me to save travel time.			
EP3.	…will help me transfer to other transport modes.	0.781	0.788	0.603
EP4.	…will enhance my engagement in activities at the destinations.			
Transaction costs of using CS (TC) adapted after Tate et al. (2011); Ma et al. (2020).				
To use a shared car, I have to…				
TC1	…invest effort to collect information about the car-sharing platform before using it.			
TC2	…spend a lot of time in advance to understand the process.	0.816	0.898	0.721
TC3	…spend time learning about the process of handling car-sharing accidents to prevent disputes after traffic accidents.			
Technology embracement (TE) adapted after Wawer et al. (2022); Acheampong and Siiba (2020).				
TE1	I think that technology is generally a good thing.			
TE2	I am excited about possibilities offered by new technologies in solving societal challenges.			
TE3	I frequently use the smartphone for smart mobility purposes.	0.865	0.866	0.650
TE4	I frequently use the smartphone for real time information.			
TE5	I frequently use the smartphone for different other purposes (entertainment, education, shopping).			
Passengers' trust in CS services providers (PTR) adapted after Yuen, Wang, Wong, and Zhou (2018); Ma et al. (2020).				
Public car-sharing platform companies…				
PTR1	…can effectively and continuously improve their services.			
PTR2	…have the knowledge and skills needed to continuously improve their services.	0.835	0.842	0.603
PTR3	…are truthful in their disclosure of continuous improvement information.			
PTR4	…sincerely continue to improve services.			
PTR5	…are oriented towards the continuous improvement in the provided service, to meet customers' needs, rather than self-interests.			
Behavioural **intention regarding CS (BICS)** adapted after Fleury, Tom, Jamet, and Colas-Maheux (2017); Curtale et al. (2022).				
I intend to use the car-sharing…				
BICS1	…occasionally.	0.803	0.806	0.629
BICS2	…when there are promotions.			
BICS3	…when I do not have other options.			
BICS4	…for my regular trips.			
BICS5	…platform and become its member.			
BICS6	…and to encourage my friends and colleagues to do so.			

the Heterotrait–Monotrait criterion.

The values generated for all variables and constructs in the study were within specified thresholds, indicating that they were valid (Hair et al., 2010; Henseler & Sarstedt, 2013).

For the Fornell-Larcker criterion, all values under the diagonal are lower than the diagonal value, while for the HTMT criterion, values are under the recommended threshold of 0.9 (Henseler, Ringle, & Sarstedt, 2014).

The model's accuracy and legitimacy of the constructs demonstrating convergent validity were determined based on the observation that all thresholds were within the required range (Chin, 1998). Consequently, it is feasible to proceed with further examination.

The collinearity of the measurement model was assessed by calculating the Variance Inflation Factors (VIF) for each item and the inner model. According to Sarstedt, Ringle, and Hair (2017), the research indicates that a maximum permissible value is 5. In this case, the item with the highest Variance Inflation Factor (VIF) was TE5, with a value of 2.235. However, this VIF value was bellow even the stricter threshold of 3.3 (Kock, 2015). The maximum VIF for the inner model was 1.846. Therefore, it can be concluded that multicollinearity is not a concern for the sample. To investigate the associations between the constructs, bootstrap analysis was conducted using 5000 subsamples. The bootstrap method was bias-corrected and accelerated and a two-tailed test was used to evaluate all hypotheses.

4.2. Evaluation of the structural model

The goodness-of-fit for both the estimated and saturated models was evaluated. The suitability of the model was demonstrated by a standardised root mean square residual (SRMR) value of 0.073 < 0.08, indicating a good fit. Additionally, the observed discrepancies were below the 99% quantile of the bootstrap discrepancies (Hi95), further demonstrating the adequacy of the model. As seen in Fig. 2, 36.2% of the Behavioural intention regarding CS usage is explained by the Expectations of performance of CS (EP), Transaction costs of using CS (TC), Technology embracement (TE), Passengers' trust in CS services

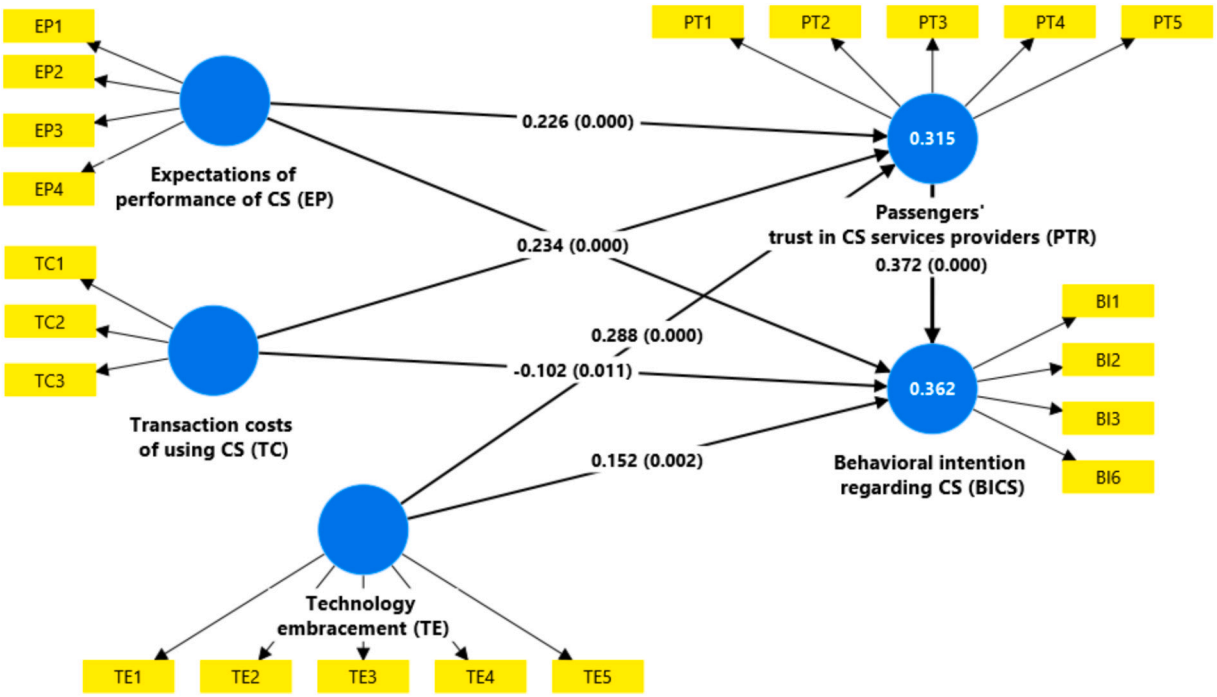

Fig. 2. Structural model.

Table 3
Discriminant validity assessment.

Constructs	BICS	EP	PTR	TE	TC	BICS	EP	PTR	TE	TC
Fornell-Larcker						Heterotrait-Monotrait (HTMT)				
BICS	**0.793**									
EP	0.476	**0.776**				0.594				
PTR	0.518	0.471	**0.776**			0.622	0.572			
TE	0.456	0.627	0.457	**0.807**		0.542	0.753	0.522		
TC)	0.104	0.279	0.331	0.119	**0.849**	0.124	0.332	0.383	0.126	

BICS: Behavioural intention regarding CS; EP: Expectations of performance of CS; PTR: Passengers' trust in CS services providers; TE: Technology embracement; TC: Transaction costs of using CS.

providers (PTR), which indicates a moderate predictive value of the model.

Testing of the inferred relationships is presented in Fig. 2 and Table 4. As seen below, nine of the hypotheses, assuming both direct and indirect effects, were supported in the current empirical framework.

The first hypothesis (H1) inferred that expectations of CS performance have a positive influence on passengers' trust in CS services providers. The results ($\beta = 0.226$; T-value $= 4.226$; $p = 0.000$) demonstrate a favourable influence; hence, H1 can be accepted. Aspects such as expectations of safety and comfort during travelling, saving time, support in transfering to other transport modes and benefits in terms of reaching the desired destinations are all contributing to the reinforcement of the customers' trust in CS services providers.

These findings are consistent with the specialized literature (Gao et al., 2017; Ma et al., 2020; Ramos et al., 2020) concluding the relevance of various elements of the expected performance of car-sharing systems for consumers' trust.

The second hypothesis (H2) presumed that the Transaction costs of

Table 4
Path coefficients and the validation of the hypotheses.

Effects	Path coefficient	T statistics	CI 2.5%	CI 97.5%	*P* values	Hypotheses testing
EP→PTR	0.226	4.226	0.121	0.334	0.000	H1 supported
TC→PTR	0.234	5.381	0.151	0.320	0.000	H2 not supported
TE→PTR	0.288	5.848	0.189	0.383	0.000	H3 supported
EP→BICS	0.234	4.440	0.130	0.335	0.000	H4 supported
TC→BICS	−0.102	2.556	−0.179	−0.021	0.011	H5 supported
TE→BICS	0.152	3.138	0.057	0.250	0.002	H6 supported
PTR→BICS	0.372	8.279	0.284	0.460	0.000	H7 supported
EP→PTR→BICS **Indirect effect**	0.084	3.621	0.042	0.134	0.000	H8 supported
TC→PTR→BICS **Indirect effect**	0.087	4.562	0.053	0.127	0.000	H9 supported
TE→PTR→BICS **Indirect effect**	0.107	4.810	0.066	0.153	0.000	H10 supported

BICS: Behavioural intention regarding CS; EP: Expectations of performance of CS; PTR: Passengers' trust in CS services providers; TE: Technology embracement; TC: Transaction costs of using CS.

using CS have a negative influence on the Passengers' trust in CS services providers. The results (β = 0.234; T-value = 5.381; p = 0.000) demonstrate the presence of a positive influence on the relationship between the two variables, thereby infirming H2. Our results suggest that the more overall effort and time is put into understanding and accessing the CS services (i.e., transaction costs), the higher the trust in the CS services providers. A tentative explanation could be that the more detailed information is collected and found (based on searching and comparing) about the service provider, the higher the level of trust of the consumer in the CS services providers, while the costs to obtain the information becomes less important in the face of new valuable information and increased knowledge. The extended version of the transaction costs theory (TCT) that includes the individual perspective along the organizational perspective (costs incurred by an economic exchange between agents), stipulates that at an individual level the TCT explains why a consumer chooses a certain business partner over another (Li & Fang, 2022), considering TCT factors, among which trust is one factor encountered also in the present study. Ma et al. (2020) discusses the relationship between trust in CS and transaction costs from the perspective of how passengers' trust in CS influence transaction costs and according to them the relationship is negative, as passengers' trust in a CS platform reduces the time spend for searching the information. Also, Kuhn et al. (2021) consider that trust in the CS services providers can compensate for the negative effect of transaction costs. Results of the present study complete these perspectives through the analysis of the relationship in the opposite direction (how transaction costs influence trust), and suggest that higher transaction costs in terms of more time invested in searching and collecting data about CS providers result in higher trust of passengers in CS providers, given that the more one searches, more quantitative and qualitative information about an organization is collected determining higher levels of trust (Radiansyah, Mahrinasari, & Bangsawan, 2023). For example, in the particular case of car-pooling, enhanced information (about cars, value proposition in terms of convenience and easiness to use) that allow for platforms' comparisons, contribute to trust development towards providers (Hartl, Penz, & Schuessler, 2025). Similar to the present study, Hou, Cheng, and Cheng (2021) found that implicit costs (such as time, convenience and opportunity costs) are positively associated with trust in the context of ride-sharing. These results reinforce the idea of a bi-directional mutual relationship between transaction costs and trust (Hartl et al., 2025; Hou et al., 2021).

Another argument for the present finding would be that the outcome of learning rather than the effort associated with learning how to access and use CS services is valued by the consumer, as knowledge acquisition increases with the frequency of use of the service (Li & Fang, 2022) and continues to build trust in the CS services providers. At the same time, on the financial side of the transaction costs (supplementary costs associated to the CS service access), results are consistent with Schaefers's (2013) who found that financial awareness has a positive effect on the buying behaviour of car-sharing services, but is in contrast with results of other investigations that found that financial awareness (which covers how individuals relate to money, to different goods and services and how decide to cut unnecessary costs) has a strong negative impact on the intention to resort to car-sharing services (Hjorteset & Böcker, 2020).

Further, Hypothesis 3 (H3) assumes that technology embracement has a positive influence on passengers' trust in CS services providers. The results (β = 0.228; T-value = 5.848; p = 0.000) indicate a positive and statistically significant influence, allowing acceptance of the hypothesis. The results are indicative of prior conclusions on the topic (Potoglou et al., 2020; Turoń, 2023a) which showed that individuals who are technology oriented were rather more inclined to trust car-sharing as these services were highly dependent on IT apps.

The fourth hypothesis (H4) investigated the relationship between expectations of CS performance and behavioural intention regarding CS usage. This influence was positive and statistically significant (β = 0.234; T-value = 4.440; p = 0.000), supporting H4. As previous studies indicated, elements such as convenience and flexibility (Correia et al., 2014), comfort and speed (Becker et al., 2017) and usefulness and ease of use (Long & Axsen, 2022) are noteworthy factors when considering customers' behavioural intention regarding CS usage.

The transaction costs of using CS have a negative influence on the behavioural intention regarding CS usage, according to Hypothesis 5 (H5). This assumption was supported by the findings (β = −0.102; T-value = 2.556; p = 0.011), which demonstrated a statistically significant negative relationship between the two constructs. The findings complement the examinations that concluded that whenever the cost of searching for accurate information and comparing different car-sharing platforms is high, customers' intention to buy the service is unfavourably affected and diminished (Hjorteset & Böcker, 2020; Ma et al., 2020).

The sixth hypothesis (H6) examines the relationship between technological embracement and behavioural intention regarding CS usage. As hypothesised, adherence to technological advancements entails a higher intention towards CS, with the relationship being significant (β = 0.152; T-value = 3.138; p = 0.002), thus confirming hypothesis (H6). These findings are consistent with those of previous studies. For example, Long and Axsen (2022), when analysing the influence of lifestyle orientation on the demand for shared vehicles, found that a higher level of engagement in technology-oriented lifestyles relates to a stronger latent demand for car-sharing technologies. These pro-technology consumers manifest increased interest (assimilated with trust and intention) in low-carbon car-sharing innovations.

The seventh hypothesis assumed that passengers' trust in CS services providers has a positive influence on behavioural intention regarding CS usage. With a highly positive and statistically significant influence, the data (β = 0.372; T-value = 8.279; p = 0.000) supported H7. Here, evidence was brought in favor of the trust factor, which was also probed as a significant influencing variable regarding the acceptance and intention to use shared mobility concepts (Kuhn et al., 2021) and other technology-related mobility solutions (driverless cars) (Kaur & Rampersad, 2018). Likewise, Shao and Yin (2018) previously concluded that customers' continuance intention in car-sharing is influenced by confidence in customers' trust in car-sharing services providers, which is beneficial for promoting their continuance intention.

The analysis of the specific indirect effects of expectations of performance of CS, transaction costs of using CS and technology embracement on behavioural intention regarding CS usage via passengers' trust in CS services providers probed the positive mediation effects of passengers' trust in CS services providers in the relationships between expectations of performance of CS and behavioural intention regarding CS usage (β = 0.084; T-value = 3.621; p = 0.000), respectively, transaction costs of using CS and behavioural intention regarding CS usage (β = 0.087; T-value = 4.562; p = 0.000) and between technology embracement and behavioural intention regarding CS usage (β = 107; T-value = 4.810; p = 0.000). Therefore, passengers' trust in CS services providers proved to be a noteworthy mediator between the considered independent and dependent variables, positively mediating all three relationships, thus complementing previous literature (Curtale et al., 2021; Nansubuga & Kowalkowski, 2021; Savastano et al., 2023; Shao & Yin, 2018; Wawer et al., 2022).

To examine whether statistically significant differences exist between male and female participants with respect to the inferred relationships among the constructs, a parametric partial least squares multi-group analysis (PLS-MGA) was conducted in accordance with Sarstedt et al. (2017). The PLS-MGA facilitated the assessment of group-specific parameter estimates, including outer weights and path coefficients. As a prerequisite of conducting the PLS-MGA, a Measurement Invariance (MI) procedure was conducted, namely the Measurement Invariance of Composite Models (MICOM). Following the three-step process of MICOM – i.e., Configural Invariance (Step 1), Compositional Invariance (Step 2), Equality of Composite Means (Step 3a) and Equality of Composite Variance (Step 3b) - led to the conclusion of partial measurement, therefore allowing us to proceed with interpreting

the MGA path coefficient comparisons. In this vein, the results indicated that a statistically significant difference was observed for only one relationship. See Table 5. As shown in this table, there is a significant difference between male and female participants in terms of how technology embracement (TE) influences passengers' trust in CS services providers (PTR).

These results might be explained by the fact that women's and men's attitudes on how technology impacts trust differ and accordingly, the influence that technology has on the development of trust in CS services providers would vary by gender. For women technology is a tool, while for men technology represents convenience, for women trust comes from safety and ease of use, while for men trust comes from usefulness (Abdullah & Mahmod, 2024).

Therefore, when adopting technology, women increase trust, while men increase convenience. Moreover, technology highly influence women's trust in car sharing, as technology gives a higher sense of safety and security to women when using shared mobility services (Catulli, Thomas, Fenner, Copsey, & Walsh, 2025). The results of the present study reinforce the existing opinion that technology contributes differently to trust development (including in shared mobility, differently based on gender, with women being more positive on technology when building trust in CS services providers.

5. Conclusions, implications, limitations and perspectives

Our enquiry about the predictors and mediators of individual behavioural intentions towards car-sharing systems indicated that 36.2% of the behavioural intention regarding CS usage was explained by the expectations of performance of CS (EP), transaction costs of using CS (TC), technology embracement (TE) and passengers' trust in CS services providers (PTR), hence displaying a moderate predictive value of the model.

Romania serves as a critical context for understanding car-sharing adoption because of its transitional economy and evolving urban mobility landscapes. The findings derived from this region can offer significant insights for countries sharing similar socio-economic dynamics. By exploring Generation Z's behaviour in Romania, this research contributes to a broader understanding of car-sharing adoption patterns. However, the generalizability of the findings is limited by the single country context of the research. These insights are particularly transferable to other emerging markets seeking sustainable urban mobility solutions. Furthermore, the Romanian case highlights the interplay between economic development, technology penetration and generational shifts in mobility preferences, making the findings generalisable to comparable settings.

Moreover, testing the ten inferred relationships among the envisaged factors confirmed nine of our research hypotheses. The findings were therefore descriptive of the significant influences of the expectations of CS performance, transaction costs of using CS, technology embracement and passengers' trust in CS services providers on the behavioural intention regarding CS, with positive impacts of performance expectancy and technology embracement on both trust in CS services providers and buying intention of CS services. The second hypothesis was also found to be significant. Conversely, this hypothesis about the influence of the transaction costs of using carsharing services on the behavioural intention regarding car-sharing usage was positive and not negative, as presumed. An explanation may be related to the added value of investing time and effort in gathering information about CS services in an emerging market, for increasing trust levels in CS providers, as a relatively new form of transportation.

The present study has a number of contributions and associated implications from theoretical, managerial and policy perspectives. This research has theoretical implications, as it contributes in two ways to the reinforcement of TPB, the main theoretical framework of this study. First, our research results proves and re-affirms the applicability of the theory of planned behaviour in the context of car sharing services, adapting the three TPB drivers in the case of CS buying intention, as: attitude towards behaviour– expectation of CS performance (comfort, convenience, time saving), subjective norms - technology embracement (as a behaviour needed and accepted by others to facilitate the use CS

Table 5
Path coefficients and specific indirect effects – MGA (Gender).

Direct effects	Original (Group_1)	Original (Group_2)	Original difference	Permutation mean difference	2.5%	97.5%	Permutation *p* value
Expectations of performance of CS (EP) - > Behavioural intention regarding CS (BICS)	0.335	0.175	0.161	0.008	−0.217	0.210	0.136
Expectations of performance of CS (EP) - > Passengers' trust in CS services providers (PTR)	0.313	0.158	0.155	0.001	−0.227	0.218	0.184
Passengers' trust in CS services providers (PTR) - > Behavioural intention regarding CS (BICS)	0.353	0.368	−0.015	−0.007	−0.185	0.164	0.868
Technology embracement (TE) - > Behavioural intention regarding CS (BICS)	0.107	0.190	−0.083	−0.001	−0.190	0.177	0.417
Technology embracement (TE) - > Passengers' trust in CS services providers (PTR)	0.159	0.378	−0.219	0.002	−0.197	0.200	**0.026**
Transaction costs of using CS (TC) - > Behavioural intention regarding CS (BICS)	−0.066	−0.115	0.050	0.002	−0.155	0.162	0.558
Transaction costs of using CS (TC) - > Passengers' trust in CS services providers (PTR)	0.274	0.209	0.065	−0.003	−0.173	0.167	0.480

Specific indirect effects	Original (Group_1)	Original (Group_2)	Original difference	Permutation mean difference	2.5%	97.5%	Permutation p value
Technology embracement (TE) - > Passengers' trust in CS services providers (PTR) - > Behavioural intention regarding CS (BICS)	0.056	0.139	−0.083	−0.002	−0.089	0.090	0.071
Transaction costs of using CS (TC) - > Passengers' trust in CS services providers (PTR) - > Behavioural intention regarding CS (BICS)	0.097	0.077	0.020	−0.003	−0.078	0.074	0.610
Expectations of performance of CS (EP) - > Passengers' trust in CS services providers (PTR) - > Behavioural intention regarding CS (BICS)	0.111	0.058	0.053	−0.001	−0.093	0.097	0.286

Looking at the bootstrapping results – in the case of male participants, $\beta = 0.159$; T-value = 1.968; $p = 0.049$ and in the case of female participants, $\beta = 0.378$; T-value = 6.300; p = 0.000 – it becomes obvious that the latter have greater trust in CS services providers, as a result of technology embracement.

platforms) and perceived behavioural control – transaction costs (the time and the effort necessary to gather information about using CS services). Second, responding to the critics brought to the TPB as lacking in terms of considering emotions as an influencer (Chen & Slade, 2025), this research enhances the TPB model by including trust as an emotional and psychological factor, as a mediator between the classical TPB drivers and the buying intention in the case of CS adoption.

The present study has practical implications, too. This inquiry brings additional information and facilitates a better understanding for practitioners (e.g. CS providers) of the influencing factors that affect the customers' intentions to buy CS services. As CS providers wish to convince more customers to use their services, this knowledge is valuable for them. One practical contribution of the present study is advancing applicative suggestions to car sharing providers and some practical recommendations are exposed. First, companies should eliminate factors that might lead to a loss of trust in car sharing services providers or that unfavourably affect buying intention, such as high transaction costs as also acknowledge as Nansubuga and Kowalkowski (2021). Based on these findings, targeted strategies, such as optimising transaction costs through user-friendly platforms and leveraging technology to enhance trust, are proposed. Given that transaction costs negatively impact the behavioural intention towards CS services, CS providers may take steps to diminish those. Generally speaking, internet platforms are known to contribute to transaction costs' reductions (Li & Fang, 2022), but further steps may be taken in this direction. One would include the design of user-friendly and useful-oriented interfaces to provide relevant knowledge to consumers in a simple, but creative way, so that information is clear and easy to find. The utilization of car-sharing applications and technologies, including intuitive designs and efficient navigation capabilities, enhances the probability of their adoption and exploitation. Perceived usefulness is a significant factor that influences outcomes when using internet platforms. If individuals believe that the CS platform will yield substantial advantages, such as instantaneous access to information, utility of information and ease of use, they will be more inclined to use it. Second, CS providers may better communicate the service value to potential customers and reduce the costs incurred to access information. More specifically, benefits associated to the service (such as enhanced cost and fuel effectiveness, increased convenience in terms of location and timing and a positive impact on environmental sustainability) need to be prevalent and clearly explained and exposed. In this context, personalizing the information offered to consumers via their accounts may also diminish transaction costs in shared services (Li & Fang, 2022). Third, given the positive impacts of both performance expectations and technology embracement on both trust in CS services providers and behavioural intention towards CS in the present study, results an even stronger need for a well-designed internet platform, on the one hand and for effective communication of all performances of the CS service, on the other. It is acknowledged that communicating the service performance positively affects the consumer's perception on the quality of the CS service (Daniele et al., 2025).

Given the propensity of CS for ESG sustainability, these findings can also be significant for public policy. As authorities are interested to promote sustainable mobility modes in order to create smart cities (Popescu & Nicolescu, 2025) and as one barrier for adopting CS services is insufficient public awareness on their benefits (Daniele et al., 2025), while identifying relevant CS buying intention's determinants (performance, technology and transaction costs), possible public policies that derive from the present study could be: taking measures for increasing public awareness about the benefits of using CS services as a form of shared mobility via advertising or educational programs. Such a policy may also contribute to helping CS service suppliers to reduce the negative impact of transaction costs on potential users' intentions, by publicly informing them about CS services. This may contribute to encouraging the use of CS services, as a sustainable mobility solution (Dyba & Kisiała, 2024).

As any other research endeavour, the present study has some limitations. First, while the subjects were conveniently selected to meet the methodological requirements, the empirical framework was determined by a specific research setting generated in Romania. Therefore, the generalizability of the results is limited by both the convenience sampling procedure used and the one country research context. Further research should be conducted in different countries to compare and/or confirm the results in different economic and cultural settings. Moreover, the investigation identified drivers and antecedents of the intention to purchase CS services, which were derived from the existing literature. This entails a certain level of subjectivity and response bias, which can be addressed in future research by introducing other measures (such as value for money, environmental concerns, etc.).

CRediT authorship contribution statement

Luminita Nicolescu: Writing – original draft, Conceptualization. **Gandolfo Dominici:** Writing – review & editing, Supervision, Data curation, Conceptualization. **Elena-Mădălina Vătămănescu:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis. **Dan-Cristian Dabija:** Writing – review & editing, Supervision, Formal analysis.

Ethical compliance

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Declaration of competing interest

The authors declare that they have NO affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

Appendix A. Types of B2C car sharing systems

The B2C car-sharing system is the most frequently encountered and has developed different types. The two main types of B2C car-sharing systems are station-based and free-floating car-sharing services (Prierto et al., 2017). Station-based systems are systems in which customers use the platform to reserve a car and then go to a fixed location and pick up the vehicle. After using the car, they had to return it to the same fixed location. Free-floating systems are described as schemes in which customers verify on an online platform where cars are available and where (the exact location of each available car) they do not need to reserve the car, they just go and pick it up; and after the car is used, customers return the car to an assigned parking place, not necessarily the one from which they pick up the car (Acheampong & Siiba, 2020; Becker et al., 2017). When using such car-sharing systems, customers participate in collaborative consumption, in which they pay for the benefits of the service without bearing the costs and responsibilities of owning a car (Ramos et al., 2020). Sustainable cities are characterized by lower car ownership (Kopp, Gerike, & Axhausen, 2015) and presently, the shift from mobility based on ownership to mobility based on access is seen as an increasing trend (Savastano et al., 2023).

Appendix B. The questionnaire

B.1. Smart mobility survey

Smart mobility refers to the use of ICT for sustainable transport technologies and one of its main forms is shared mobility. This questionnaire is about smart and shared mobility. The questionnaire has an academic purpose and your input is very important for the success of the

research. Please answer the following questions by clicking on the statement that best suits you, especially considering your behaviour. Your answers are confidential and will be used only for research purposes.

Q1. Do you agree to participate to the Smart Mobility survey?

Yes

No

Q2. How much knowledge do you have about car sharing services?

No knowledge

Some knowledge

A lot of knowledge

Q3. Car sharing services refer to open access shared vehicle programs/platforms and are offered as ride sharing [peer to peer (P2P) = car owners who share their cars with other peers or as car sharing (business to consumer (B2C) = companies that have a fleet offered to multiple customers as shared rentals].

Have you heard before about the concepts of Ride sharing/car pooling/P2P car sharing?

Yes

No

Q4. Car sharing services refer to open access shared vehicle programs/platforms and are offered as ride sharing [peer to peer (P2P) = car owners who share their cars with other peers or as car sharing (business to consumer (B2C) = companies that have a fleet offered to multiple customers as shared rentals].

Have you heard before about the concepts of Car sharing/B2C car sharing?

Yes

No

Q5. Have you ever used:

Ride sharing/car pooling/P2P car sharing? via platforms such as: Uber, Bolt, Free Now, ZerO.

Yes

No

Q6. Have you ever used:

Car sharing/B2C car sharing? via platforms such as: Spark, Citylink, Teleport, Perpetoo, Carpool, GDFrent.

Yes

No

Q7. Gender

Male

Female

Q8. Age

……..

Q9. Level of education

High school.

Bachelor student.

Master student.

PhD student.

Other.

Q10. Do you have a driving licence?

Yes

No

Q11. Do you have access to a car to drive in your household?

Yes

No

Q12. Please rate your level of agreement with the following statements on a scale from 1 to 5 (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, 5 = strongly agree).

Expectations of performance of car sharing (Curtale et al., 2021).

EP1. I expect a safe and comfortable car from car sharing companies.

EP2. I expect that the car sharing service will help me to save travel time.

EP3. I expect that the car sharing service will help me transfer to other transport modes.

EP4. I expect that the car sharing service will enhance my engagement in activities at the destinations.

Q13. Please rate your level of agreement with the following statements on a scale from 1 to 5 (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, 5 = strongly agree).

Transaction costs of using car sharing (Ma et al., 2020**; Tate et al., 2011).**

TC1. I have to invest effort to collect information about the car sharing platform before using the shared car.

TC2. To use a shared car, I have to spend a lot of time in advance to understand the process.

TC3. I have to spend a lot of time learning about the process of handling car sharing accidents to prevent disputes after traffic accidents.

TC4. Generally speaking, the cost of using shared cars is higher compared to taxis.

Q14. Please rate your level of agreement with the following statements on a scale from 1 to 5 (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, 5 = strongly agree).

Technology embracement (Acheampong & Siiba, 2020**;** Wawer et al., 2022**).**

TE1. I think that technology is generally a good thing.

TE2. I am excited about possibilities offered by new technologies in solving societal challenges.

TE3. I frequently use the smartphone for smart mobility purposes.

TE4. I frequently use the smartphone for real time information.

TE5. I frequently use the smartphone for different other purposes (entertainment, education, shopping).

Q15. Please rate your level of agreement with the following statements on a scale from 1 to 5 (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, 5 = strongly agree).

Passenger Trust in car sharing services providers (Ma et al., 2020**;** Yuen et al., 2018**).**

PT1. Public car-sharing platform companies can effectively and continuously improve their services.

PT2. Public car-sharing platform companies have the knowledge and skills needed to continuously improve their services.

PT3. Public car-sharing platform companies are truthful in their disclosure of continuous improvement information.

PT4. Public car-sharing platform companies sincerely continue to improve services.

PT5. The continuous improvement in the service provided by public car-sharing platform companies is oriented to meet the needs of the public, rather than self-interests.

Q16. Please rate your level of agreement with the following statements on a scale from 1 to 5 (1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, 5 = strongly agree).

Behavioural intention for car sharing services (BI) (Curtale et al., 2022; Fleury et al., 2017).

BI1 I intend to use the car sharing occasionally.

BI2 I intend to use the car sharing when there are promotions.

BI3 I intend to use the car sharing when I do not have other options.

BI4 I intend to use the car sharing for my regular trips.

BI5 I Intend to be a member of the car sharing platform.

BI6 I would encourage my friends/colleagues to use the car sharing.

Thank you!

Data availability

Data will be made available on request.

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